ABSTRACT

A method for tracking the motion of a person's face for the purpose of animating a 3-D face model of the same or another person is disclosed. The 3-D face model carries both the geometry (shape) and the texture (color) characteristics of the person's face. The shape of the face model is represented via a 3-D triangular mesh (geometry mesh), while the texture of the face model is represented via a 2-D composite image (texture image). Both the global motion and the local motion of the person's face are tracked. Global motion of the face involves the rotation and the translation of the face in 3-D. Local motion of the face involves the 3-D motion of the lips, eyebrows, etc., caused by speech and facial expressions. The 2-D positions of salient features of the person's face and/or markers placed on the person's face are automatically tracked in a time-sequence of 2-D images of the face. Global and local motion of the face are separately calculated using the tracked 2-D positions of the salient features or markers. Global motion is represented in a 2-D image by rotation and position vectors while local motion is represented by an action vector that specifies the amount of facial actions such as smiling-mouth, raised-eyebrows, etc.

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